

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. – 7. (Cancelled)

8. (Currently amended) Knockout bacteria of *Lactobacillus reuteri* lacking glycerol dehydrogenase activity, which are obtained by knocking out the gene encoding glycerol dehydrogenase, wherein the knockout bacteria more efficiently produce 1,3-propanediol and 3-hydroxypropionic acid compared to *Lactobacillus reuteri* that do not lack glycerol dehydrogenase activity.

9. (Currently amended) Knockout bacteria of *Lactobacillus reuteri* comprising the pdu operon and a gene encoding phosphotransacylase, but not the gene encoding glycerol dehydrogenase, wherein the knockout bacteria more efficiently produce 1,3-propanediol and 3-hydroxypropionic acid compared to *Lactobacillus reuteri* that do not lack glycerol dehydrogenase activity.

10. (Cancelled)

11. (Currently amended) A transformant of ~~*E. coli*~~ or *Lactobacillus reuteri* comprising genes introduced from *Lactobacillus reuteri* encoding:

(a) large, medium, and small subunits of glycerol dehydratase, ~~and/or large, medium, and small subunits of diol dehydratase~~

wherein the gene encoding the large subunit of glycerol dehydratase encodes a protein

comprising the amino acid sequence of SEQ ID NO: 1 or 3,

wherein the gene encoding the medium subunit of glycerol dehydratase encodes a protein

comprising the amino acid sequence of SEQ ID NO: 5 or 7, and

wherein the gene encoding the small subunit of glycerol dehydratase encodes a protein

comprising the amino acid sequence of SEQ ID NO: 9 or 11;

(b) large and small subunits of a reactivation factor for glycerol dehydratase, and/or large and small subunits of a reactivation factor for diol dehydratase

wherein the gene encoding the large subunit of the reactivation factor for glycerol

dehydratase encodes a protein comprising the amino acid sequence of SEQ ID NO: 19 or

21, and

wherein the gene encoding the small subunit of the reactivation factor for glycerol

dehydratase encodes a protein comprising the amino acid sequence of SEQ ID NO: 23 or

25;

(c) propionaldehyde dehydrogenase,

wherein the gene encoding propionaldehyde dehydrogenase encodes a protein comprising

the amino acid sequence of SEQ ID NO: 41; and

(d) propanol dehydrogenase,

wherein the gene encoding propanol dehydrogenase encodes a protein comprising the

amino acid sequence of SEQ ID NO: 13 or 15, or

wherein the gene encoding propanol dehydrogenase encodes 1,3-propanediol

oxidoreductase and comprises the amino acid sequence of SEQ ID NO: 17.

12. (Currently amended) A method for producing 1,3-propanediol and/or 3-hydroxypropionic acid comprising:

- (a) obtaining the knockout bacteria of claim 8,
- (b) culturing the knockout bacteria in the presence of glycerol, and
- (c) purifying the 1,3-propanediol and/or 3-hydroxypropionic acid.

13. (Currently amended) A method for producing 1,3-propanediol and/or 3-hydroxypropionic acid comprising:

- (a) obtaining the knockout bacteria of claim 9,
- (b) culturing the bacteria in the presence of glycerol, and
- (c) purifying the 1,3-propanediol and/or 3-hydroxypropionic acid.

14 – 25. (Cancelled)

26. (New) The transformant according to claim 11, further comprising a gene encoding phosphotransacylase and a gene encoding propionate kinase, but not any gene encoding glycerol dehydrogenase.

27. (New) The transformant according to claim 26, wherein the gene encoding propionate kinase encodes a protein comprising the amino acid sequence of SEQ ID NO: 43.

28. (New) The transformant according to claim 26, which comprises the pdu operon.

29. (New) A method for producing 1,3-propanediol and 3-hydroxypropionic acid comprising:

- (a) obtaining the transformant according to claim 11,
- (b) culturing the transformant in the presence of glycerol, and
- (c) purifying the 1,3-propanediol and 3-hydroxypropionic acid.

30. (New) A transformant of *Lactobacillus reuteri* comprising genes introduced from *Lactobacillus reuteri* encoding:

- (a) large, medium, and small subunits of glycerol dehydratase,
 - wherein the gene encoding the large subunit of glycerol dehydratase comprises the nucleotide sequence as shown in SEQ ID NO: 2 or 4,
 - wherein the gene encoding the medium subunit of glycerol dehydratase comprises the nucleotide sequence of SEQ ID NO: 6 or 8, and
 - wherein the gene encoding the small subunit of glycerol dehydratase comprises the nucleotide sequence of SEQ ID NO: 10 or 12;
- (b) large and small subunits of a reactivation factor for glycerol dehydratase;
 - wherein the gene encoding the large subunit of the reactivation factor for glycerol dehydratase comprises the nucleotide sequence of SEQ ID NO: 20 or 22 and
 - wherein the gene encoding the small subunit of the reactivation factor for glycerol dehydratase comprises the nucleotide sequence of SEQ ID NO: 24 or 26;
- (c) propionaldehyde dehydrogenase,
 - wherein the gene encoding propionaldehyde dehydrogenase comprises the nucleotide sequence of SEQ ID NO: 42; and

(d) propanol dehydrogenase,

wherein the gene encoding propanol dehydrogenase comprises the nucleotide sequence of SEQ ID NO: 14 or 16, or

wherein the gene encoding propanol dehydrogenase encodes 1,3-propanediol oxidoreductase and comprises the nucleotide sequence of SEQ ID NO: 18.

31. (New) The transformant according to claim 30, further comprising a gene encoding phosphotransacylase and a gene encoding propionate kinase, but not any gene encoding glycerol dehydrogenase.

32. (New) The transformant according to claim 31, which comprises the pdu operon.

33. (New) The transformant according to claim 31, wherein the gene encoding propionate kinase comprises the nucleotide sequence of SEQ ID NO: 44.

34. (New) A method for producing 1,3-propanediol and 3-hydroxypropionic acid comprising:

- (a) obtaining the transformant according to claim 30,
- (b) culturing the transformant in the presence of glycerol, and
- (c) purifying the 1,3-propanediol and 3-hydroxypropionic acid.